

Hyperthyroidism

Presenting as Isolated Tricuspid Regurgitation and Right Heart Failure

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Although hyperthyroidism has many signs and symptoms, right heart failure can occasionally be the main presenting symptom. We describe the case of a previously healthy 42-year-old woman whose chief complaint was progressive bilateral lower extremity edema. The echocardiogram revealed right atrial dilatation and moderate-to-severe tricuspid regurgitation. Results of laboratory studies were consistent with hyperthyroidism. Thyroid ablation resulted in permanent resolution of symptoms and resolution of tricuspid incompetence on echocardiography. In a case of isolated, unexplained tricuspid regurgitation, it is important to consider indolent hyperthyroidism in the differential diagnosis. (Tex Heart Inst J 2005;32:244-5)

Primary tricuspid regurgitation, without evidence of other cardiopulmonary or venous thromboembolic disease, is occasionally seen with tricuspid valve prolapse, carcinoid heart disease, infective endocarditis, right-sided myxoma, and cardiac trauma. A few case reports have indicated that hyperthyroidism too may cause isolated tricuspid insufficiency and right heart failure.¹⁻⁵ The relationship, however, is not widely appreciated: most authoritative medical textbooks do not list hyperthyroidism among the causes of tricuspid regurgitation.⁶⁻⁹ We describe the case of a patient who presented with tricuspid regurgitation and right heart failure and was found to have clinically indolent hyperthyroidism.

Case Report

In September 1999, a previously healthy 43-year-old woman came to the hospital because of a 10-day history of progressive swelling in her feet, ankles, and legs. She had experienced no shortness of breath or chest pain. Her temperature was 37.2 °C; heart rate, 104 beats/min; and blood pressure, 130/70 mmHg. She had an elevated jugular venous pressure with a prominent V wave, parasternal heave, a soft 2/6 systolic murmur at the left sternal border, and bilateral lower extremity edema. The chest radiograph showed an enlarged cardiac silhouette with prominent vasculature in the lung fields and a blunted right costophrenic angle. On echocardiography, there was normal left atrial and left ventricular size with preserved left ventricular systolic and diastolic function. The right atrium was dilated, and there was incomplete systolic coaptation of the tricuspid leaflets, which resulted in moderate-to-severe tricuspid regurgitation (Fig. 1). The estimated right ventricular systolic pressure was 46 mmHg. Results of a pulmonary ventilation-perfusion scan were normal.

Upon further investigation, we found that the patient had experienced some heat intolerance, increased perspiration, and a 19-lb weight loss over the last few months. A thyroid function panel revealed a low thyroid-stimulating hormone level (<0.003 mIU/L), and elevated levels of free thyroxine and free triiodothyronine (42 pmol/L and 10.0 nmol/L, respectively). The patient was given low-dose furosemide, propranolol, and propylthiouracil. She subsequently underwent thyroid ablation.

Further evaluation and specific treatment for pulmonary hypertension, tricuspid regurgitation, and right heart failure were postponed. Three months later, at a time when the thyroid function test results were all within normal limits, the symptoms of right heart failure had resolved. Repeat echocardiography showed a normal right atrium and trace tricuspid regurgitation. Over a 4-year follow-up period, the patient remained asymptomatic from a cardiac perspective.

Key words: Hyperthyroidism/complications/diagnosis; pulmonary hypertension; right heart failure; thyrotoxicosis; tricuspid valve insufficiency/diagnosis/etiology; ventricular dysfunction, right

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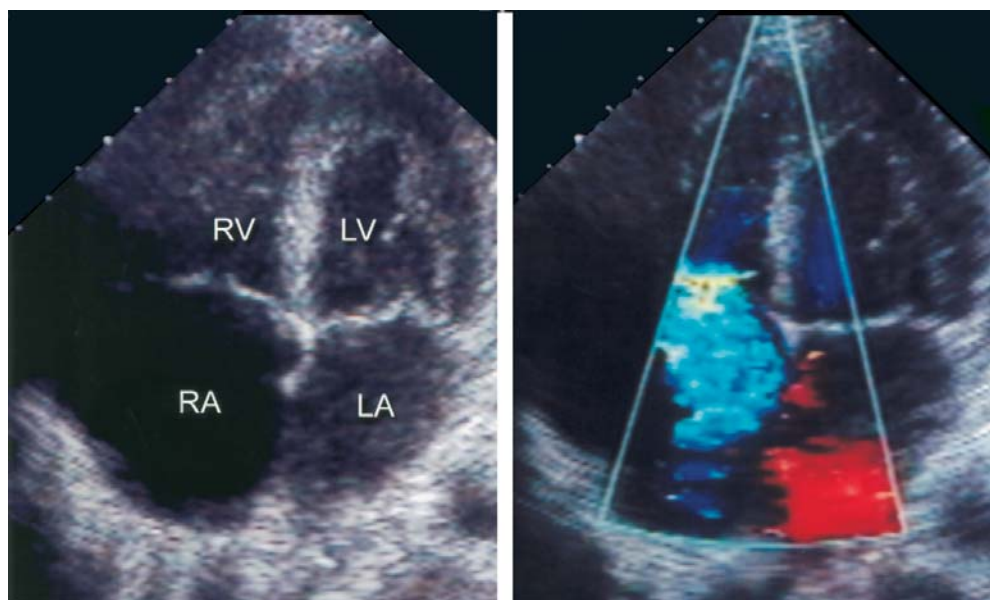


Fig. 1 Echocardiographic and Doppler studies in the apical 4-chamber view show marked right atrial dilatation (4.3×5.5 cm) with incomplete systolic coaptation of the tricuspid leaflets (left), and moderate-to-severe tricuspid regurgitation (right).

LA = left atrium; LV = left ventricle; RA = right atrium; RV = right ventricle

Discussion

The mechanism whereby hyperthyroidism can precipitate right heart failure is not completely understood. It has been postulated that increased circulatory dynamics in the hyperthyroid patient impart increased blood volume and more rapid venous return to the pressure- and volume-sensitive right ventricle.^{3,5,10} Consequently, pulmonary arterial and right ventricular pressures increase, and the right ventricle becomes dilated.³ This can result in functional tricuspid regurgitation. Once tricuspid regurgitation occurs, the increased volume overload further dilates the tricuspid annulus and a vicious cycle is begun. Treatment of hyperthyroidism not only decreases the cardiac output but also results in a decrease in pulmonary and right ventricular pressures.^{5,10} Because less pressure is placed on the right heart, the dilatation can resolve, along with the manifestations of tricuspid regurgitation.

Patients with hyperthyroid tricuspid regurgitation may present with a paucity of symptoms, as in our case, resulting in delayed recognition of hyperthyroidism.^{1,3,4} When faced with a case of isolated, unexplained tricuspid regurgitation and right heart failure, it is important to consider hyperthyroidism in the differential diagnosis. Prompt recognition of this relationship can avoid unnecessary and costly testing for other causes. Moreover, in most described cases, as in ours, treatment of hyperthyroidism alone resulted in complete resolution of tricuspid regurgitation and right heart failure.¹⁻⁵

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